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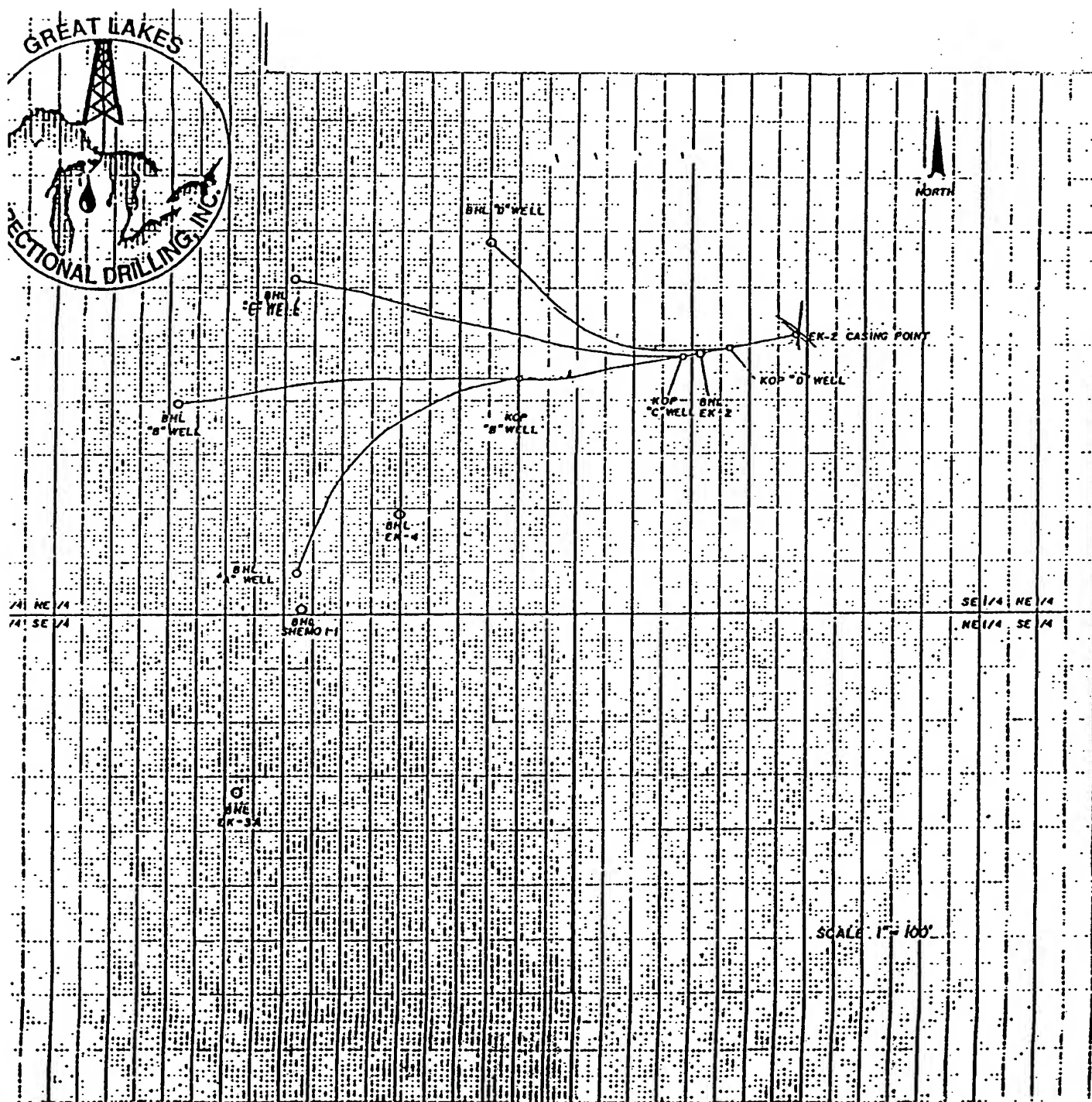
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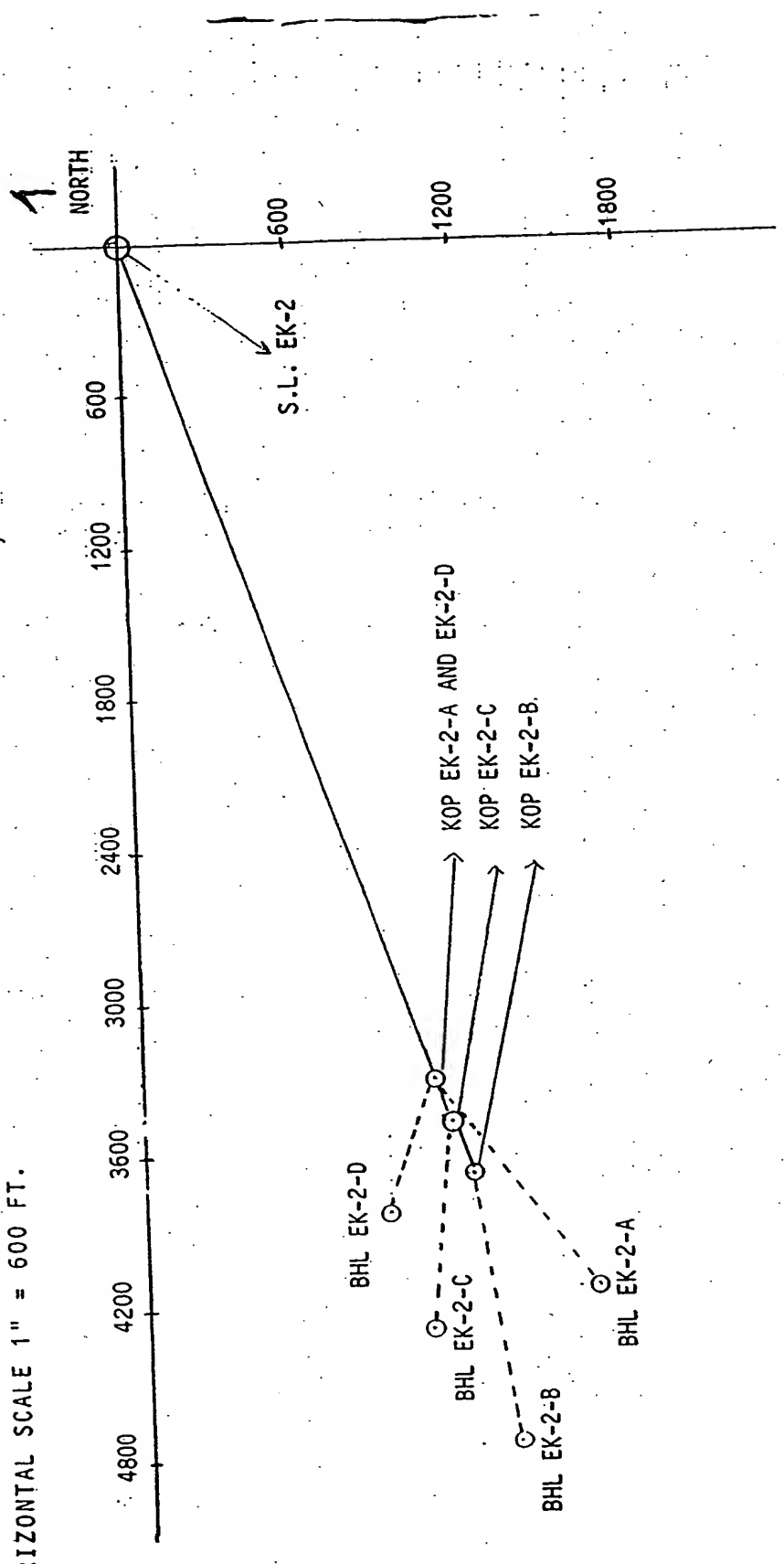
Actual



EXCELSIOR 6 - E. KALKASKA 1
GAS STORAGE FIELD
PLAN VIEW COMPOSITE PROJECTION

PROPOSED

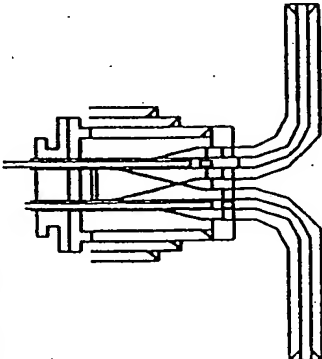
HORIZONTAL SCALE 1" = 600 FT.



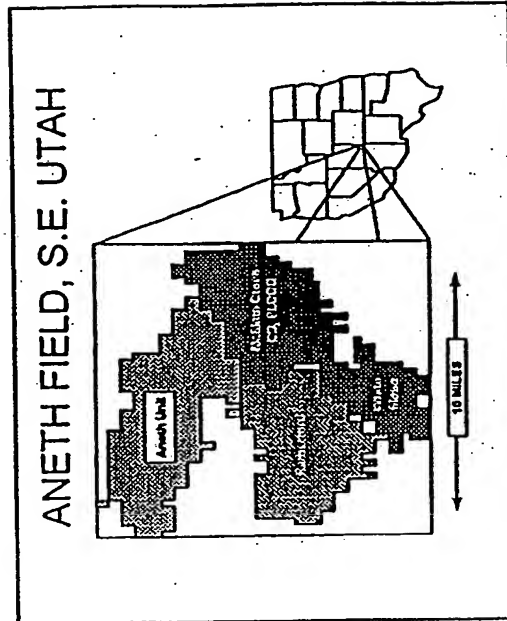
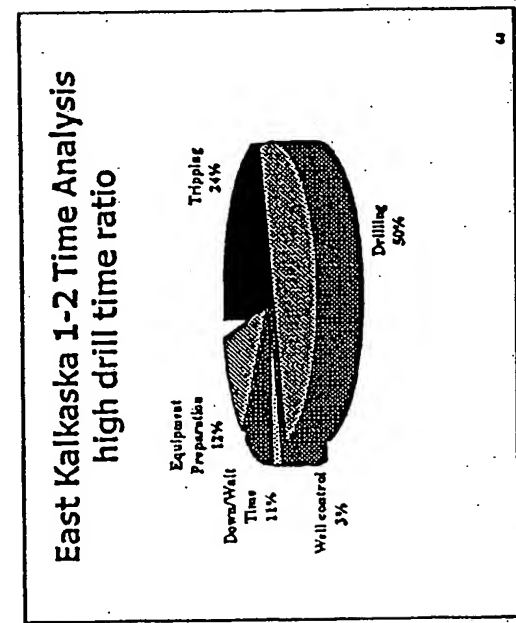
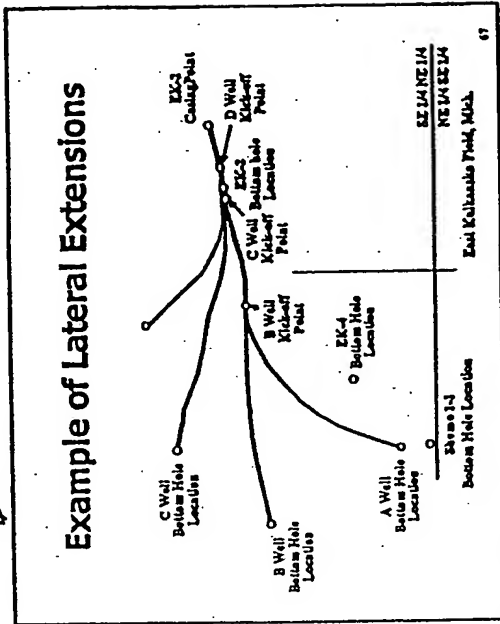
USED By Manner Eng.
 Bob Knolly & Petroleum
 Tech Transfer
 Council

Marathon Baker Splitter System

Install Side by Side Wellheads
 One Slot = Two Wells
 Great Economics



4



Daily Report -- GENERAL CHEMICAL CANADA LTD.

Well Name: BRINE WELL P-7 TO P-4 #2

Field: ANDERDON TWP.

Log: BRADCO RIG #2

Test Csg. Pt: 1050'

Size: 8 5/8"

Log Rep: KATHY McCONNELL

Well Pusher: SAM STEVENSON

Phone:

Date: 07-23-1998

Report No: 30

Job No:

Rept. Ending: 6:00A.M. 07-24

End Depth: 1747'

Start Depth: 1150'

Daily Cost: \$8,000.00

Total Cost: \$30,400.00

Fax:

Job Parameters:

Plane of Proposal: S88.5W

Surface Location N/S: 0.00

E/W: 0.00

Bottom Hole N/S: 4.65

E/W: 600.00

Log. Corr. True: 0.00

Grid: 0.00

Well Elevation: 10.00

Time and Activity Breakdown:

1:00 A.M. P.U. MOTOR #350001 G.L. SET ON 2.12", SURFACE TEST & T/IN.

1:30 A.M. R.U. W.C..

1:30 A.M. DRLG. W/116 STKS. 850 PSI., 800 TO 1,000 PSI. HYD. TQ.

2:00 Midnight 07-24-98

1:00 A.M. HIT CAVERN @ 1747' MD, 1144' TVD, 642' V.S., SHOULD HAVE BEEN 550' V.S.??

12 HRS. DRLG., 597', AVG. 50' PER HR.

1:30 A.M. PULL BACK 3 JTS. & GOING TO CIRC. TILL NOON W/ F.W..

NOTE the DATE!

Brine Well P-7, Anderdon 6-11-II

SECTION 4.0 - CASING AND CEMENTING SUMMARY

Surface Casing:

Csg. Size OD (mm)	Hole Size (mm)	Weight (kg/m)	Grade & Thread	Depth (mKB)	Cementing
298	381	69.94	K-55 ST&C	30.5 m	3.4 tonnes Class G cement + 2% CaCl ₂ - cmt to surface with 100% excess

Intermediate Casing:

Csg. Size OD (mm)	Hole Size (mm)	Weight (kg/m)	Grade & Thread	Depth (mKB)	Cementing
219	273	35.72	K-55 ST&C	307	Fill Cement - 10.5 tonnes Class G cement + 2% CaCl ₂ + 8% gel - cmt to surface with 100% excess Tail Cement - Class G cement + 2% CaCl ₂ - cmt volume will be calc to push fill cmt to surface

Horizontal Hole:

well bore intersect!

200 mm horizontal hole will be drilled in two directions to intersect with wells P-4 and P-10 (see plan view and cross-sectional view of horizontal portion of the well)

Production Casing:

Csg. Size OD (mm)	Hole Size (mm)	Weight (kg/m)	Grade & Thread	Depth (mKB)	Cementing
140	200	20.83	K-55 ST&C	370	hung in well head

GREAT LAKES DIRECTIONAL DRILLING

Report of Survey

Minimum Curvature Method

MEASURED DEPTH	INCL.	DIRECTION	VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES		DLS Deg/100'
1130.00	0 54	N 9 0 E	1126.88	-1.30	9.18 N	1.54 E	
1161.00	24 24	N 73 0 W	1156.94	4.94	11.32 N	4.64 W	78.35
1187.00	58 48	N 73 0 W	1176.10	21.32	16.30 N	20.90 W	132.31
1203.00	76 18	N 88 0 W	1182.21	35.87	18.60 N	35.39 W	139.19
1213.00	82 0	S 83 0 W	1184.10	45.66	18.16 N	45.19 W	105.14
1225.00	90 6	S 73 0 W	1184.93	57.27	15.67 N	56.87 W	107.03
1235.00	94 30	S 71 54 W	1184.53	66.71	12.66 N	66.40 W	45.35
1245.00	96 0	S 72 24 W	1183.61	76.10	9.61 N	75.88 W	15.80
1256.00	93 24	S 75 48 W	1182.71	86.56	6.61 N	86.42 W	38.83
1266.00	92 54	S 78 54 W	1182.16	96.24	4.42 N	96.16 W	31.35
1276.00	93 54	S 83 6 W	1181.57	106.05	2.86 N	106.02 W	43.10
1286.00	94 36	S 86 18 W	1180.82	115.96	1.94 N	115.95 W	32.67
1296.00	93 12	N 90 0 W	1180.14	125.91	1.62 N	125.92 W	39.48
1306.00	90 30	N 87 48 W	1179.82	135.91	1.81 N	135.91 W	34.82
1315.00	87 36	N 85 12 W	1179.97	144.90	2.36 N	144.89 W	43.27
1325.00	86 0	N 83 24 W	1180.53	154.85	3.35 N	154.82 W	24.06
1335.00	84 30	N 80 36 W	1181.36	164.76	4.73 N	164.69 W	31.68
1346.00	85 18	N 79 18 W	1182.33	175.59	6.65 N	175.48 W	13.84
1356.00	86 42	N 77 36 W	1183.03	185.41	8.64 N	185.25 W	21.99
1366.00	87 30	N 75 42 W	1183.54	195.19	10.95 N	194.97 W	20.59
1376.00	87 54	N 77 12 W	1183.94	204.96	13.29 N	204.68 W	15.51
1386.00	88 24	N 78 54 W	1184.26	214.79	15.36 N	214.46 W	17.71
1396.00	88 48	N 81 0 W	1184.51	224.67	17.11 N	224.30 W	21.37
1405.00	89 12	N 83 0 W	1184.66	233.62	18.36 N	233.21 W	22.66
1415.00	90 0	N 84 42 W	1184.73	243.58	19.43 N	243.15 W	18.79
1425.00	90 30	N 86 0 W	1184.69	253.57	20.24 N	253.12 W	13.93
1435.00	90 24	N 85 42 W	1184.61	263.56	20.96 N	263.09 W	3.16
1445.00	90 6	N 87 30 W	1184.57	273.55	21.56 N	273.08 W	18.25
1455.00	89 42	N 89 0 W	1184.59	283.55	21.86 N	283.07 W	15.52
1464.00	89 24	N 90 0 W	1184.66	292.55	21.94 N	292.07 W	11.60
1474.00	89 6	S 88 54 W	1184.79	302.54	21.84 N	302.07 W	11.40
1484.00	89 0	S 87 30 W	1184.95	312.52	21.53 N	312.06 W	14.03
1494.00	88 42	S 86 24 W	1185.15	322.49	21.00 N	322.04 W	11.40
1504.00	88 18	S 85 48 W	1185.42	332.44	20.32 N	332.02 W	7.21
1514.00	89 18	S 86 30 W	1185.62	342.39	19.65 N	341.99 W	12.20

GENERAL CHEMICAL CANADA LTD.
BRINE WELL #R-10 TO #R-5
ANDERDON TWP., ESSEX CO., MI

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MEASURED DEPTH	INCL.	DIRECTION	VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES	DLS Deg/100'
1524.00	90 0	S 86 54 W	1185.69	352.36	19.07 N 351.98 W	8.06
1534.00	90 30	S 87 18 W	1185.64	362.33	18.57 N 361.96 W	6.40
1544.00	90 24	S 87 30 W	1185.56	372.30	18.11 N 371.95 W	2.24
1553.00	89 42	S 88 12 W	1185.56	381.28	17.77 N 380.95 W	11.00
1563.00	87 54	S 88 18 W	1185.76	391.26	17.47 N 390.94 W	18.03
1573.00	87 24	S 87 42 W	1186.17	401.24	17.12 N 400.92 W	7.81
1583.00	89 6	S 88 48 W	1186.48	411.22	16.82 N 410.91 W	20.24
1593.00	89 24	S 87 48 W	1186.61	421.20	16.52 N 420.91 W	10.44
1603.00	88 24	S 87 12 W	1186.80	431.17	16.08 N 430.90 W	11.66
1614.00	88 24	S 87 30 W	1187.11	442.14	15.57 N 441.88 W	2.73
1624.00	89 42	S 88 48 W	1187.28	452.12	15.25 N 451.87 W	18.38
1634.00	91 6	N 89 0 W	1187.21	462.11	15.23 N 461.87 W	26.07
1643.00	89 12	N 89 12 W	1187.18	471.11	15.38 N 470.87 W	21.23
1653.00	88 48	N 89 54 W	1187.36	481.11	15.45 N 480.87 W	8.06
1663.00	90 24	S 89 12 W	1187.43	491.10	15.39 N 490.87 W	18.36
1673.00	90 42	S 88 48 W	1187.33	501.09	15.22 N 500.87 W	5.00
1683.00	90 0	S 88 30 W	1187.27	511.08	14.98 N 510.86 W	7.61
1693.00	89 54	S 89 12 W	1187.28	521.07	14.78 N 520.86 W	7.07
1703.00	90 12	S 89 18 W	1187.27	531.06	14.65 N 530.86 W	3.16
1713.00	90 30	N 88 24 W	1187.21	541.06	14.73 N 540.86 W	23.19
1723.00	90 6	N 88 6 W	1187.16	551.06	15.03 N 550.86 W	5.00
1733.00	88 48	N 89 0 W	1187.25	561.06	15.29 N 560.85 W	15.81
1743.00	88 0	S 89 54 W	1187.53	571.05	15.37 N 570.85 W	13.60
1753.00	88 6	N 89 30 W	1187.87	581.04	15.40 N 580.84 W	6.08
1762.00	89 24	S 89 48 W	1188.07	590.04	15.42 N 589.84 W	16.40
1772.00	90 24	S 89 54 W	1188.09	600.03	15.40 N 599.84 W	10.05
1782.00	91 6	N 88 54 W	1187.95	610.03	15.49 N 609.84 W	13.89
1792.00	91 36	N 87 18 W	1187.72	620.03	15.82 N 619.83 W	16.76
1802.00	92 0	N 86 12 W	1187.40	630.02	16.38 N 629.81 W	11.70
1812.00	91 0	N 86 24 W	1187.14	640.01	17.03 N 639.78 W	10.20
1822.00	90 36	N 86 48 W	1187.00	650.00	17.62 N 649.76 W	5.66
1832.00	90 36	N 87 12 W	1186.90	660.00	18.15 N 659.75 W	4.00
1842.00	91 30	N 86 6 W	1186.72	669.99	18.73 N 669.73 W	14.21
1853.00	90 54	N 87 18 W	1186.49	680.98	19.36 N 680.71 W	12.19
1863.00	90 18	N 87 24 W	1186.38	690.98	19.82 N 690.70 W	6.08
1873.00	88 36	N 87 42 W	1186.48	700.98	20.25 N 700.69 W	17.26
1882.00	89 12	N 89 6 W	1186.65	709.98	20.50 N 709.68 W	16.92
1892.00	90 36	N 89 24 W	1186.67	719.98	20.63 N 719.68 W	14.32
1902.00	91 54	N 89 18 W	1186.45	729.97	20.75 N 729.68 W	13.04
1915.00	92 12	N 89 6 W	1185.98	742.96	20.93 N 742.67 W	2.77

GENERAL CHEMICAL CANADA LTD.
BRINE WELL #R-10 TO #R-5
ANDERDON TWP., ESSEX CO., MI

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RECTANGULAR DLS
COORDINATES Deg/100'

MEASURED DEPTH	INCL.	DIRECTION	VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES	DLS Deg/100'
1925.00	92 24	N 88 48 W	1185.58	752.95	21.11 N 752.66 W	3.60
1935.00	91 42	N 88 36 W	1185.22	762.95	21.34 N 762.65 W	7.28
1945.00	90 18	S 89 48 W	1185.05	772.94	21.44 N 772.65 W	21.26
1955.00	90 36	S 89 24 W	1184.97	782.94	21.37 N 782.65 W	5.00
1976.00	92 30	N 88 0 W	1184.40	803.93	21.63 N 803.64 W	15.33
1986.00	92 12	N 87 18 W	1183.99	813.92	22.04 N 813.62 W	7.61
1996.00	91 54	N 87 24 W	1183.64	823.91	22.50 N 823.60 W	3.16
2008.00	91 12	N 87 42 W	1183.31	835.90	23.01 N 835.59 W	6.35
2018.00	91 12	N 87 30 W	1183.10	845.90	23.43 N 845.57 W	2.00
2029.00	90 6	N 87 48 W	1182.98	856.90	23.88 N 856.56 W	10.36
2041.00	89 0	N 87 6 W	1183.07	868.89	24.42 N 868.55 W	10.86
2050.00	89 12	N 87 12 W	1183.21	877.89	24.87 N 877.54 W	2.48
2060.00	89 24	N 87 0 W	1183.33	887.89	25.37 N 887.53 W	2.83
2072.00	89 18	N 87 30 W	1183.47	899.88	25.95 N 899.51 W	4.25
2082.00	89 42	N 88 6 W	1183.56	909.88	26.33 N 909.50 W	7.21
2092.00	90 42	S 89 36 W	1183.52	919.88	26.46 N 919.50 W	25.08
2107.00	91 0	N 88 24 W	1183.30	934.88	26.62 N 934.50 W	13.48
2122.00	92 0	N 84 12 W	1182.91	949.86	27.59 N 949.46 W	28.77
2134.00	92 0	N 84 12 W	1182.49	961.81	28.80 N 961.39 W	0
2149.00	92 0	N 84 12 W	1181.96	976.76	30.31 N 976.30 W	0

Final location: 976.77 feet at N 88 13 W
Plane of Vertical Section: 271.52 degrees

GREAT LAKES DIRECTIONAL DRILLING

Report of Survey

Minimum Curvature Method

MEASURED DEPTH	INCL.	DIRECTION	VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES		DLS Deg/100'
1925.00	92.40	271.20	1185.58	752.93	21.11 N	752.66 W	
1935.00	91.70	275.00	1185.22	762.92	21.65 N	762.64 W	38.61
1946.00	92.00	277.50	1184.87	773.88	22.85 N	773.57 W	22.88
1956.00	91.40	279.30	1184.57	783.82	24.31 N	783.45 W	18.97
1966.00	90.40	279.30	1184.41	793.74	25.92 N	793.32 W	10.00
1976.00	89.20	278.80	1184.45	803.66	27.50 N	803.20 W	13.00
1986.00	87.90	277.40	1184.70	813.60	28.90 N	813.09 W	19.10
1997.00	87.50	274.80	1185.14	824.57	30.07 N	824.02 W	23.89
2009.00	88.90	274.70	1185.52	836.55	31.07 N	835.97 W	11.70
2019.00	89.20	274.00	1185.68	846.54	31.82 N	845.94 W	7.61
2029.00	89.60	275.70	1185.79	856.53	32.67 N	855.91 W	17.46
2041.00	89.80	275.60	1185.85	868.50	33.85 N	867.85 W	1.86
2051.00	90.30	273.30	1185.84	878.49	34.63 N	877.82 W	23.54
2061.00	91.30	274.00	1185.70	888.49	35.26 N	887.79 W	12.21
2072.00	91.20	273.00	1185.46	899.48	35.93 N	898.77 W	9.13
2082.00	90.70	271.70	1185.30	909.48	36.34 N	908.76 W	13.93
2092.00	89.10	269.20	1185.32	919.47	36.42 N	918.76 W	29.68
2123.00	92.20	270.10	1184.96	950.44	36.23 N	949.75 W	10.41
2133.00	93.10	271.00	1184.50	960.43	36.33 N	959.74 W	12.72
2164.00	93.00	271.00	1182.85	991.38	36.87 N	990.69 W	.32

Final location: 991.38 feet at 272.13 degrees
Plane of Vertical Section: 272.07 degrees

GENERAL CHEMICAL
BRINE WELL R-10 TO R-5
ANDERDON TWP., ESSEX CO., ONTARIO

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GREAT LAKES DIRECTIONAL DRILLING

Report of Survey

Minimum Curvature Method

MEASURED DEPTH	INCL.	DIRECTION	VERTICAL DEPTH	VERTICAL SECTION	RECTANGULAR COORDINATES	DLS Deg/100'
1966.00	90 24	N 80 42 W	1184.41	793.74	25.92 N 793.32 W	
1997.00	87 30	N 85 36 W	1184.98	824.61	29.62 N 824.08 W	18.36
2009.00	89 36	N 84 18 W	1185.28	836.59	30.67 N 836.03 W	20.58
2092.00	89 6	S 89 12 W	1186.22	919.54	34.22 N 918.90 W	7.85
2123.00	92 18	N 90 0 W	1185.85	950.50	34.00 N 949.90 W	10.64

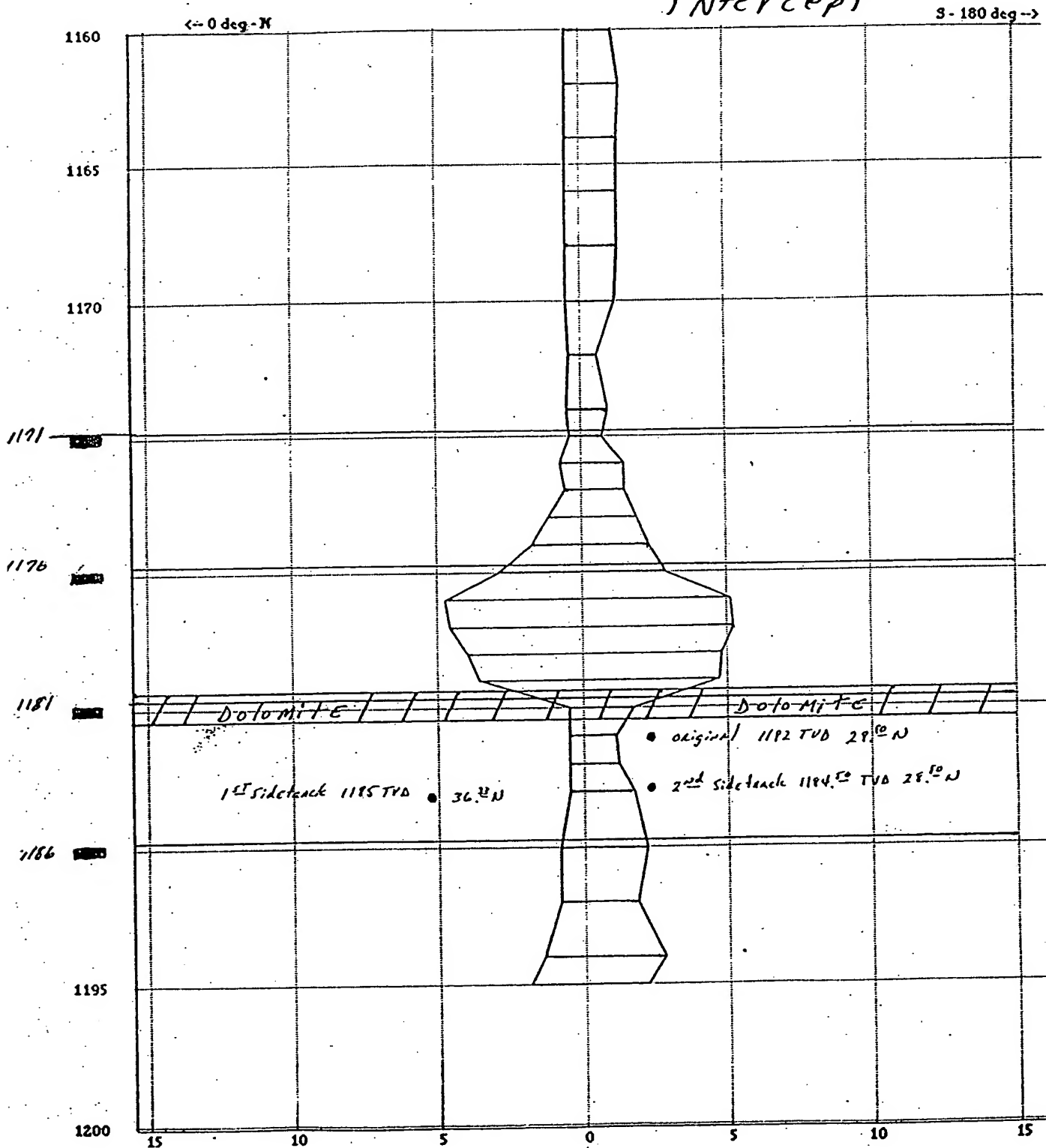
Final location: 950.50 feet at N 87 57 W
Plane of Vertical Section: 272.07 degrees

GENERAL CHEMICAL
AMHERSTBURG, ONT.

SONARWIRE, INC
Vertical Cross Section

BRINE WELL NO. R-5
R-5 Fr, Oct 29, 1999

*Note enlarged cavity for
intercept*



ANDERDON TWP., ESSEX CO., MI

